Reviewer's report

Title: Smoking and primary total hip or knee replacement due to osteoarthritis in 54,288 elderly men and women

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Reviewer: David Felson

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This is an intriguing article providing additional data about smoking and osteoarthritis. While the study architecture is clear and the study is thoughtfully designed, there are concerns that lessen enthusiasm. These are mostly related to confounding and bias.

1. The failure to count TJR”s just after the blood pressure exam is a potentially major source of bias. For example, there could have been a higher rate of TJR’s among smokers just after the blood pressure exam that would have been missed, leaving fewer smokers to get TKR’s thereafter.

2. It appears that the smoking analysis presented in tables 4 and 5 were carried out adjusting for ordinal categories of body mass index, but this leaves room for residual confounding by bmi.

3. Since smokers remain thinner over time, a one time measure of BMI is probably insufficient to examine the confounding effect of BMI on smoking and TJR. Even more concerning is that the mean subject age at baseline was 72 years and that smokers at that time had worse comorbidity scores than nonsmokers. That would have probably worsened over time (time varying comorbidity in smokers) so that smokers would have gotten sick enough that they might not have been candidates for this elective surgery.

4. Note that a comorbidity of special interest given that the outcome is TJR is lung capacity/pulmonary function. Smokers have much worse pulmonary function and this may have made them ineligible for TJR. A comorbidity index would not have captured this well nor would a competing risk of death analysis.

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare I have no competing interests.